

Gillian H. Gile

Assistant Professor

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EDUCATION

- August 2009 PhD in Botany
University of British Columbia, Canada
“Molecular Evolution of the Eukaryotic Translation Elongation Factor, EFL”
- May 2005 BS *summa cum laude* in Botany
Humboldt State University, California, USA

RESEARCH APPOINTMENTS

- 2015-present **Assistant Professor**, School of Life Sciences, Arizona State University, Tempe.
Molecular evolution of symbioses, including termite-protist symbiosis, plastid endosymbiosis, and *Azolla-Nostoc* symbiosis.
- 2013-2015* **Postdoctoral Fellow**, Archibald lab, Dalhousie University, Nova Scotia, Canada
Comparative genomics of algae, protein targeting to complex plastids of cryptophytes and diatoms.
- 2009-2013[†] **Postdoctoral Fellow**, Slamovits lab, Dalhousie University, Nova Scotia, Canada
Comparative genomics of apicomplexan parasites and their free-living relatives, evolution of parabasalid protozoan symbionts of cockroaches, comparative genomics and protein targeting of chlorarachniophyte and cryptophyte algae.
- 2005-2009 **PhD student**, Keeling lab, University of British Columbia, Canada
Lateral gene transfer and differential loss of translation elongation factors, protein targeting to complex plastids, barcoding chlorarachniophyte algae, diversity and systematics of parabasalid protozoan symbionts of lower termites.

* maternity leave taken January 2, 2014-September 30, 2014

† maternity leave taken October 11, 2011-October 10, 2012

PUBLICATIONS (20 in print, 11 first or co-first author)

Čepička I, Dolan MF, **Gile GH**. Parabasalia. In: *Handbook of Protists*, Archibald JM, Simpson AGB, Slamovits CH eds. Springer, submitted.

Sierra R, Cañas-Duarte SJ, Burki F, Schwelm A, Fogelqvist J, Dixelius C, González-García LN, **Gile GH**, Slamovits CH, Klopp C, Restrepo S, Arzul I, and Pawlowski J. Evolutionary origins of rhizarian parasites. *Molecular Biology and Evolution* 33:980-983.

Gile GH, Moog D, Slamovits CH, Maier U-G, and Archibald JM. 2015. Dual organellar targeting of aminoacyl-tRNA synthetases in diatoms and cryptophytes. *Genome Biology and Evolution* 7:1728-1742.

Gile GH, James ER, Okamoto N, Carpenter KJ, Scheffrahn RH, and Keeling PJ. 2015. Molecular evidence for the polyphyly of *Macrotrichomonas* (Parabasalia: Cristamonadea) and a proposal for *Macrotrichomonoides* n. gen. *Journal of Eukaryotic Microbiology* 62:494-504.

Tai V, **Gile GH**, Pan J, James ER, Carpenter KJ, Scheffrahn RH, and Keeling PJ. 2015. The phylogenetic position of *Kofoidia loriculata* (Parabasalia) and its implications for the evolution of the Cristamonadea. *Journal of Eukaryotic Microbiology* 62:255-259.

Gile GH and Slamovits CH. 2014. Transcriptomic analysis reveals evidence for a cryptic plastid in the colpodellid *Voromonas pontica*, a close relative of chromerids and apicomplexan parasites. *PLoS ONE* 9:e96258.

Gile GH[†], Carpenter KJ[†], James ER, Scheffrahn RH, and Keeling PJ. 2013. Morphology and molecular phylogeny of *Staurojoenina mulleri* sp. nov. (Trichonymphida, Parabasalia) from the hindgut of the kalotermitid *Neotermes jouteli*. *Journal of Eukaryotic Microbiology* 60:203-213.
[†]Contributed equally.

Curtis BA, Tanifuji G, Burki F, Gruber A, Irimia M, Maruyama S, Arias MC, Ball SG, **Gile GH**, and 64 additional co-authors. 2012. Algal genomes reveal evolutionary mosaicism and the fate of nucleomorphs. *Nature* 492:59-65.

Pawlowski J, Audic S, Adl S, Bass D, Belbahri L, Berney C, Bowser SS, Čepička I, Decelle J, Dunthorn M, Fiore-Donno A-M, **Gile GH**, and 21 additional co-authors. 2012. CBOL Protist Working Group: Barcoding eukaryotic richness beyond the animal, plant and fungal kingdoms. *PLoS Biology* 10:e1001419.

Gile GH and Slamovits CH. 2012. Phylogenetic position of *Lophomonas striata* Bütschli (Parabasalia) from the hindgut of the cockroach *Periplaneta americana*. *Protist* 163:274-283.

Saldarriaga J[†], **Gile GH**[†], James ER, Horák A, Scheffrahn RH, and Keeling PJ. 2011. Morphology and molecular phylogeny of *Pseudotriconympha hertwigi* and *Pseudotriconympha paulistana* (Trichonymphea, Parabasalia) from neotropical rhinotermitids. *Journal of Eukaryotic Microbiology* 58:487-496. [†]Contributed equally.

Gile GH, James ER, Scheffrahn RH, Carpenter KJ, and Keeling PJ. 2011. Molecular and morphological analysis of the Calonymphidae with a description of *Calonympha chia* sp. nov.,

Snyderella kirbyi sp. nov., *Snyderella swezyae* sp. nov., and *Snyderella yamini* sp. nov. *International Journal of Systematic and Evolutionary Microbiology* 61:2547-2558.

Cocquyt E, **Gile GH**, Leliaert F, Verbruggen H, Keeling PJ, and De Clerck O. 2010. Complex phylogenetic distribution of a non-canonical code in green algae. *BMC Evolutionary Biology* 10:e327.

Hirakawa Y, **Gile GH**, Ota S, Keeling PJ, and Ishida K. 2010. Characterization of periplastid compartment targeting signals in chlorarachniophytes. *Molecular Biology and Evolution* 27:1538-1545.

Gile GH[†], Stern RF[†], James ER, and Keeling PJ. 2010. DNA barcoding of chlorarachniophytes using nucleomorph ITS sequences. *Journal of Phycology* 46:743-750. [†]Contributed equally.

Gile GH, Novis PM, Cragg DS, Zuccarello GC, and Keeling PJ. 2009. The distribution of EF-1 α , EFL, and a non-canonical genetic code in the Ulvophyceae: Discrete genetic characters support a consistent phylogenetic framework. *Journal of Eukaryotic Microbiology* 56:367-372.

Harper JT, **Gile GH**, James ER, Carpenter KJ, and Keeling PJ. 2009. The inadequacy of morphological concepts for species and genus delineation in microbial eukaryotes: An example from the parabasal termite symbiont, *Coronympha*. *PLoS ONE* 4:e6577.

Gile GH, Faktorová D, Castlejohn CA, Burger G, Lang BF, Farmer MA, Lukeš J, and Keeling PJ. 2009. Distribution and phylogeny of EF-1 α and EFL in Euglenozoa suggest an ancient introduction of EFL followed by differential loss. *PLoS ONE* 4:e51162.

Gile GH and Keeling PJ. 2008. Nucleus-encoded periplastid-targeted EFL in chlorarachniophytes. *Molecular Biology and Evolution* 25:1967-1977.

Gile GH, Patron NJ, and Keeling PJ. 2006. EFL GTPase in cryptomonads and the distribution of EFL and EF-1 α in chromalveolates. *Protist* 157:435-444.

Gould SB, Sommer MS, Kroth PG, **Gile GH**, Keeling PJ, and Maier UG. 2006. Nucleus-to-nucleus gene transfer and protein retargeting into a remnant cytoplasm of cryptophytes and diatoms. *Molecular Biology and Evolution* 23:2413-2422.

AWARDS AND DISTINCTIONS

Research grants

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| 2016 | NSF EAGER grant, "Rapid isolation of live microbial species from environmental communities", \$149,173 for two years |
| 2011 | Gordon and Betty Moore Foundation Marine Microbial Eukaryote Transcriptome Program: full transcriptome sequencing of the haplosporidian <i>Minchinia chitonis</i> |

Supporting fellowships

- 2009-2011 Natural Sciences and Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship, \$40,000 per year for 2 years
- 2007-2009 NSERC Postgraduate Doctoral Fellowship, \$21,000 per year for 3 years
- 2006-2007 UBC University Graduate Fellowship, \$16,000 for one year
- 2005-2006 UBC Botany Department Entrance Scholarship, \$5,000

Honors and distinctions

- 2013 International Society of Protistologists Holz-Connor Travel Fund award, \$1,000
- 2009 UBC Graduate Teaching Assistant Award for Teaching, \$1,000
- 2008 International Society of Protistologists Jahn-Bovee Award for outstanding student presentation
- 2008 International Society of Protistologists Holz-Connor Travel Fund award, \$1,150
- 2008 International Society for Evolutionary Protistology travel award, \$300
- 2005 UBC Botany Department Frances Chave Memorial Scholarship, \$2,200
- 2004 HSU Botany Department Meredith Scholarship, \$300
- 2002 American Association of University Women Scholarship, \$1,000

TEACHING

Curriculum courses

- Spring 2016 *Deep Evolution* – ASU BIO/MIC 494, BIO 591
Instructor: developed a new lecture/readings/discussion-format course covering the evolution and diversity of unicellular eukaryotes, with focus on endosymbiosis, the origin of eukaryotes, and the origin of life.
- Spring 2008 *Plant Evolution* – UBC BIOL 415
Co-Instructor: developed course scope and goals along with two other co-instructors, planned and delivered one third of the course lectures, graded student assignments, met with students to help develop their term project ideas.

Research experience courses

- Spring 2016 *Undergraduate research experience* – ASU BIO/MIC 495
Mentor: introduced students to molecular and computational biology techniques for microbial biodiversity research; students presented their work at the School of Life Sciences Undergraduate Poster Symposium and at the American Society for Microbiology Arizona/Southern Nevada Branch Meeting.
Trevor Merrell, Katalina Peterson, Daniel Jasso-Selles, Mikaela Garcia
- Spring 2016 *Research paper* – ASU MIC 401
Reader: provided advice and feedback on capstone research paper: **Jacob Hrkal**

Spring 2016 *Honors thesis – ASU BIO 493*
Supervisor and chair: supervised Barrett honors student **Jacob Hrkal**, provided guidance and feedback on multiple thesis drafts, chaired honors thesis defense

Guest lectures

Spring 2016 *Advanced Molecular and Cellular Biology – ASU MCB 556*
Lecture topic: protist genomics

Spring 2016 *Molecular and Cellular Biology Colloquium – ASU MCB 701*
Lecture topic: microbial symbioses: termite gut symbionts and plastids

Fall 2015 *Biology of Microorganisms – ASU MIC 220*
Lecture topic: cell biology of microbial eukaryotes

Fall 2012, 2013 *Microbial Eukaryotes – Dalhousie BIOL 3102*
Lecture topic: protist-bacteria symbioses in the termite gut

Assistant teaching

Fall 2008 *Protistology – UBC BIOL 332*
Teaching assistant: developed lab exercises, delivered pre-lab lectures, graded tests and assignments, provided support and guidance to students.

2004, 2005 *Genetics – HSU BIOL 340*
Facilitator: conducted group tutorials under the Howard Hughes Medical Institute Academic Excellence Initiative Program (HHMI-AEIP).

2003, 2004 *General Botany – HSU BOT 105*
Facilitator: under HHMI AEIP as for *Genetics*.

MENTORING

Postdoctoral researchers

2016-present Stephen Taerum, postdoctoral fellow
2016-present Francesca de Martini, senior research specialist

Graduate students

2016-present Julie Bethany Rakes, ASU Environmental Life Sciences PhD student
2015-present Ariana Eily, Duke University Biology PhD student (committee member)

Undergraduate students

2015-present Katalina Peterson, ASU Applied Biological Sciences
Trevor Merrell, ASU Biomedical Sciences
Mikaela Garcia, ASU Medical Microbiology
Daniel Jasso-Selles, ASU Microbiology

2011-2012 Sarah Dowler, Dalhousie Biochemistry co-op student
2010-2011 Hugo Lai, Dalhousie Biochemistry undergraduate honors student
Summer 2007 David Cragg, NSERC Undergraduate Student Research Award recipient

SELECTED PRESENTATIONS

"Microbial symbioses recent and ancient: termite gut endosymbionts and plastids"
Invited seminar, presented November 2015 at the Systematics Discussion Group, Duke University

"Aminoacyl-tRNA synthetase gene sharing in complex algae"
Contributed talk, presented December 2014 at the Dalhousie University and Christian-Albrechts-Universität zu Kiel Workshop on Evolutionary Genomics of Symbiosis

"Evidence for a cryptic plastid in the colpodellid *Voromonas pontica*"
Contributed talk, presented July 2013 at the International Congress of Protistology (ICOP XIV) and August 2013 at the International Colloquium on Endocytobiology and Symbiosis

"Progress in bioinformatic characterization of the PPC proteome"
Invited talk, presented September 2011 at the *Guillardia theta* and *Bigelowiella natans* Genome Jamboree, DOE Joint Genomes Institute

"Phylogenetic position of *Lophomonas*: Implications for character evolution in Parabasalia"
Invited talk, presented July 2011 at the European Congress of Protistology (ECOP VI)

"Molecular evolution of the eukaryotic translation elongation factor, EFL"
Seminar, presented March 2009 at the UBC Botany Department Seminar Series

"Nucleus-encoded periplastid-targeted EFL in chlorarachniophytes"*
Contributed talk, presented July 2008 at the joint meeting of the International Society of Evolutionary Protistology (ISEP) and the International Society of Protistology (ISoP)
*awarded Jahn-Bovee prize for outstanding student presentation

"Targeting of EF-1 α and EFL in cryptomonad and chlorarachniophyte algae"
Invited seminar, presented November 2007 at the Humboldt State University Biological Sciences Department Seminar Series

PROFESSIONAL SERVICE

2015-2016 **Co-Organizer**: American Society for Microbiology Arizona-Southern Nevada (ASM AZNV) Branch Meeting
2015-2016 **Committee member**: Search committee for two new faculty in the area of microbiome research

2015-2016 **Committee member:** Molecular and cellular biology (MCB) graduate student admissions committee

Manuscript review

Molecular Phylogenetics and Evolution 2015
Journal of Phycology 2014, 2015
Biomed Research International 2014
African Journal of Microbiology Research 2013
Molecular Biology and Evolution 2010, 2011
European Journal of Protistology 2010
Phycological Research 2010

ASU research center affiliations

Biodiversity Knowledge Integration Center (BioKIC)
Center for Fundamental and Applied Microbiomics (CFAM)

Society memberships

International Society of Protistologists
International Society for Evolutionary Protistology
International Society of Endocytobiology
American Society for Microbiology